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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/505,415

**Applicant(s)**

KATUSIC ET AL.

**Examiner**

ABIGAIL FISHER

**Art Unit**

1616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-13 and 16-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-13 and 16-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

The examiner for your application in the USPTO has changed. Examiner Abigail Fisher can be reached at 571-270-3502.

Receipt of Amendments/Remarks filed on September 26 2008 is acknowledged. Claims 2 and 14-15 were/stand cancelled. Claims 1 and 8-12 were amended. Claims 28-35 were added. Claims 1, 3-13 and 16-35 are pending.

Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

### ***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d) and MPEP § 608.01(o). Specifically, the instant specification fails to provide antecedent basis for claims 16-26. The instant specification indicates that the powder of the invention can be used as a sunscreen, as a vulcanizing agent, a dye in inks, in synthetic resins, in pharmaceutical and cosmetic preparations, as a ceramic raw material, and as a catalyst. However, the specification fails to provide antecedent basis for the methods and products claimed. The examiner suggests adding the claims to the instant specification.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) **BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).**
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

### **Content of Specification**

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.

- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
  - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
  - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.

- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

The specification is objected to because it currently does not contain the proper content, specifically there is no brief description or detailed description of the drawings. Appropriate correction is required. It is noted that descriptions of the drawings appear

in the examples. The examiner suggests taking those descriptions and forming the brief description section as required by 37 CFR 1.74.

### ***Claim Objections***

Claim 8 is objected to because of the following informalities: the claim as currently written. As the examiner understands the claim recites that the four successive reaction zones are the evaporation zone, the nucleation zone, the oxidation zone and the quench zone. However, the appearance of these four zones right after the "four successive reaction zones" can be confusing. Appropriate correction is required. The examiner suggests adding in the phrase wherein the four successive reactions zones are in line 3 between zones and evaporation.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 8-13, 16, 18, 22, 23, 24, 26 and 28-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent

protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 8 recites the broad recitation fuel gas, and the claim also recites preferably hydrogen which is the narrower statement of the range/limitation.

Claim 8 as currently written is vague and indefinite. The claim recites that in the evaporation zone the conditions are under the proviso that the reaction parameters are chosen such that oxidation of the zinc does not occur. Firstly, the instant claims or the instant specification do not indicate what these parameters are. Therefore it is unclear what parameters applicants are attempting to claim. Secondly, the reaction conditions require a flame of air and/or oxygen. Therefore it is unclear how some of the zinc, albeit even a small amount, is not oxidized to zinc oxide. In order for zinc to be oxidized, oxygen needs to be present. Both oxygen and air possess oxygen, therefore, it would appear that at least some of the zinc is oxidized to zinc oxide. Bunce (US Patent 2013980) specification indicates that the presence of air tends to cause the zinc to form



zinc oxide (column 1, lines 43-45). Therefore, the said language renders claim 8 indefinite.

Claim 8 as currently written is vague and indefinite. The claims recites that the zinc oxide powder is separated from the gas stream by means of "other suitable separators". However, the instant claims nor the instant specification indicate what these "other suitable separators" are. Therefore, the resulting claim does not clearly set forth the metes and bounds of the patent protection desired for separation materials.

Claim 8 recites the limitation "the hot reaction mixture" in line 9. There is insufficient antecedent basis for this limitation in the claim. Specifically, there is no reaction mixture indicated earlier in the claim.

Claim 13 as currently written is vague and indefinite. The claim recites wherein air and/or oxygen and the fuel gas can be supplied to one or more points within the evaporation zone. However, it is unclear what or where these points are that are being referred to. Claim 13 depends from claim 8 and does not indicate that there are points within the evaporation zone. Furthermore, claim 8 indicates that in order for evaporation to occur, which is the purpose of the "evaporation zone", a flame of air and/or oxygen and a fuel gas are needed. Therefore, this further causes confusion as to the points as a flame of air and/or oxygen and the fuel gas are required for this zone.

#### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Applicant Claims
2. Determining the scope and contents of the prior art.
3. Ascertaining the differences between the prior art and the claims at issue, and resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1, 3-13, 20-22 and 28-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimaru et al. (US Patent No. 5560871) in view of Cyr (US Patent No. 2200873) and Hunter (US Patent No. 77618).**

### **Applicant Claims**

The instant application claims a composition comprising nanoscale pyrogenically produced zinc oxide powder having a BET surface of 10 to 200 m<sup>2</sup>/g, wherein said composition is in the form of aggregates of anisotropic primary particles and that the aggregates display an average diameter of 50 to 300 nm wherein the aggregates comprise a mixture of nodular primary particles and acicular primary particles whereby the ratio of nodular to acicular primary particles is between 99:1 and 1:99. The instant application claims a process for the production of the composition wherein zinc powder is converted to zinc oxide powder in four successive reaction zones which are an evaporation zone, a nucleation zone, an oxidation zone and a quench zone.

### **Determination of the Scope and Content of the Prior Art (MPEP §2141.01)**

Yoshimaru et al. is directed to a method for preparing electrically conductive zinc oxide. It is generally taught that the vapor mixture comprising zinc vapor and vapor of a doping agent can be prepared by injecting through a nozzle the dopant forming material in an inert gas into a stream of the zinc vapor prior to the introduction into an oxidation chamber. Therefore, the mixture comprises zinc vapor, the dopant material and an inert gas. The temperature of the vaporization and entry into the oxidation temperature is maintained at a particular temperature, for instance 910 °C (column 2, lines 21-27). It is taught that the vapor mixture is introduced into an oxidation chamber and mixed with an oxidizing gas injected therein through a nozzle to burn and oxidize the zinc vapor (column 3, lines 48-52). It is taught that the amount of oxidizing gas to be used may appropriate be selected depending on the desired particle size and particle size

distribution of the resulting zinc oxide (column 4, lines 5-7). Figure 1 is a diagram of the apparatus used for practicing the method. The apparatus comprising a rectifying column for refining zinc and forming the zinc vapor, a nozzle for injecting a vapor mixture, an oxidation chamber, a nozzle for injecting an oxidizing gas, a tube for introducing cooling air, a bag filter and an aspiration fan (column 4, lines 27-35). In the apparatus a rectifying column for refining zinc is used for generating zinc vapor, but other zinc vapor generating devices such as a retort, a crucible or electric furnace may be used (column 4, lines 50-55). It is taught zinc vapor is preferably not less than 850 °C. This is because if the temperature of the zinc vapor is less than 850 °C, it is observed that part of the zinc remains unreacted (column 5, lines 10-13). It is taught that the amount of oxidation gas is controlled, preferably an equivalent ratio of oxygen/zinc. If the oxidation of the vapor is too high then the mixture is cooled and the oxidation thereof is sometimes insufficient (column 5, lines 29-40). After oxidation the zinc is cooled with air and collected through a bag filter (column 5, lines 40-45). Example 1 is directed to the formation of conductive zinc oxide. Zinc oxide which had been evaporated and refined was introduced into a mixing zone with a vapor comprising the doping agent, then the vapor was introduced into an oxidation chamber. After the oxidation the zinc vapor was cooled and filtered. Examples 6-11, which are made by the same procedures of example 1 exhibit a BET surface area that fall within those instantly claimed (table 2). The temperature of oxidation is either 40 or 500 °C. It is generally taught that zinc oxides are known to be useful as pigments kneadable with paints and varnishes, resins, rubbers and figures (column 1, lines 21-25).

**Ascertainment of the Difference Between Scope the Prior Art and the Claims  
(MPEP §2141.012)**

Yoshimaru et al. do not specify the conditions for evaporating zinc. However, this deficiency is cured by Cyr and Hunter.

Cyr is directed to zinc oxide. It is taught that zinc that is to be oxidized may be evolved either by volatilizing metal zinc in a suitable type of retort and the zinc vapor evolved is diluted with a non-oxidizing gas. The mixture of zinc vapor and diluting gas is then burned in a slow flame at a controlled temperature above 950 °C but less than 1200 °C to allow for the formation of acicular crystals (column 1, lines 39-55). Diluting gas examples are atmospheric nitrogen (column 3, lines 33-34). It is taught that when the combustion chamber is maintained in the lower range, say only slightly above 950 °C, long thin acicular crystals are obtained (column 4, lines 69-71). At higher temperatures growth is intensified and plates and spear-headed shaped crystals are formed (column 5, lines 5-7). High turbulence in the combustion chamber produces more complex and irregular crystals (column 5, lines 12-13).

Hunter is directed to the manufacture of zinc. It is taught that deoxidizing gas includes hydrogen (line 14).

***Finding of Prima Facie Obviousness Rationale and Motivation  
(MPEP §2142-2143)***

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to combine the teachings of Yoshimaru et al., Cyr and Hunter and utilize a retort with hydrogen and nitrogen as non-oxidizing gases. One of ordinary skill in the art would have been motivated to utilize a retort with non-oxidizing gases as

Yoshimaru et al. teach that the zinc vapor may be formed in a retort and Cyr teaches forming zinc vapor in a retort utilizing non-oxidizing gas such as nitrogen in order to ensure that the zinc vapor does not convert to zinc oxide before it is desirable to convert it. One of ordinary skill in the art would have been motivated to utilize hydrogen as it is taught by Hunter as a deoxidizing gas that is utilized in the manufacture of zinc. Therefore, since both nitrogen and hydrogen are known in the art as non-oxidizing gases, it would have been obvious to one of ordinary skill in the art utilize both gases. As a general principle it is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose, the idea of combining them flows logically from their having been individually taught in the prior art. See *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) **MPEP 2144.06**. It would have been obvious to one of ordinary skill in the art to burn the zinc vapor in a slow flame in order to form acicular zinc oxide as taught by Cyr.

Regarding the claimed particle size, since the process taught by Yoshimaru et al. is substantially similar to that instantly claimed, it is the examiner's position that the particle shape will be the same as instantly claimed. Furthermore, based on the teachings of Cyr, one of ordinary skill in the art would have been motivated to maintain the temperature in the range taught by Cyr in order to form acicular particles or adjust it higher or utilize high turbulence in order to change the shape of the crystals.

Regarding the claimed particle size, it is the examiner's position that the position that the particle size of the zinc oxide of the particles of Yoshimaru et al. are the same

as instantly claimed since the process taught by Yoshimaru et al. is substantially similar to that instantly claimed. Furthermore based on the teachings of Yoshimaru, it would have been obvious to one of ordinary skill in the art to manipulate the amount of oxidizing gas used depending on the desired particle size and particle size distribution of the resulting zinc oxide.

Regarding the claimed anisotropic structure, oxygen concentration at the surface of the powder, transmission at a wavelength of 310 nm and 360 nm and the bulk density, it is the examiner's position that the particles of Yoshimaru et al. are the same as instantly claimed since the process taught by Yoshimaru et al. is substantially similar to that instantly claimed.

Regarding claims 10-12 and 29-35, based on the teachings of Yoshimaru et al. and Cyr the temperature in the evaporation zone is higher than 850 °C, in order to form acicular crystals as well in order to make sure all of the zinc is reacted. The oxidation temperatures of Yoshimaru et al. are 500 °C. Furthermore, based on the teachings of Yoshimaru et al. and Cyr it would have been obvious to one of ordinary skill in the art to optimize the temperatures in order to ensure one gets the desired shape as well as complete reaction. It would have been obvious to one of ordinary skill in the art to optimize the cooling rate as temperature and cooling are parameters that are taught as specifically controlling the shape of the particles and the reaction. Yoshimura et al. teaches that the zinc is first converted into a vapor and then mixed with the doping material then oxidized and then filtered. As can be seen in the apparatus of Figure 1,

the zinc vapor flows through the whole device and there is necessarily some time that the zinc vapor is spent in each compartment.

As taught by Yoshimura et al., zinc oxide is known in the art to be utilized as pigments kneadable with paints and varnishes and resins. Therefore, it would have been obvious to one of ordinary skill in the art to add zinc oxide to paints, varnishes or resins in order to make these respective compositions as these are known uses for the zinc oxide.

Absent any evidence to the contrary, and based upon the teachings of the prior art, there would have been a reasonable expectation of success in practicing the instantly claimed invention. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

**Claims 16-19 and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimaru et al. in view of Cyr and Hunter and in further view of Laundon (US Patent No. 5876688) or Wang et al. (J. Applied Polymer Science, 1998) or Spencer (Topics in Catalysis, 1999) or Jenkins et al. (US Patent No. 4448608)**

#### **Applicant Claims**

Applicants claim a sunscreen comprising the produced zinc oxide and a method for producing a sunscreen. Applicants claim a method for vulcanizing and a vulcanizing agent comprising the produced zinc oxide. Applicants claim a method for dyeing or



pigments and a dye or pigment comprising the produced zinc oxide. Applicants claim a method for preparing synthetic resins comprising the produced zinc oxide. Applicants claim a method for producing a pharmaceutical or cosmetic preparation comprising the produced zinc oxide. Applicants claim a method for producing ceramics and ceramic raw material comprising the produced zinc oxide. Applicants claim a method for producing a catalyst and a catalyst comprising the produced zinc oxide.

**Determination of the Scope and Content of the Prior Art  
(MPEP §2141.01)**

The teachings of Yoshimaru et al., Cyr and Hunter are set forth above. Yoshimaru et al. describes a process for forming zinc oxide. Cyr and Hunter teach the formation of zinc vapor utilizing a retort and non-oxidizing gases.

**Ascertainment of the Difference Between Scope the Prior Art and the Claims  
(MPEP §2141.012)**

Laundon et al. is directed to zinc oxide and a process of making it. It is taught that zinc oxide is known to be utilized in applications where effective absorption of ultra-violet radiation is desirable such as sunscreens, paints, cosmetics, etc. (column 1, lines 9-15).

Wang et al. teach that vulcanizing of polychloroprene with metal oxides is well studied (page 1220, left column, second paragraph). Exemplified vulcanization process includes the addition of zinc oxide (experimentals).

Spencer teaches that zinc oxide is known to be utilized as a catalyst for methanol synthesis (introduction).

Jenkins et al. teach that complexes with zinc oxides are suitable for use as a pigment in a wide variety of applications such as paints and ceramics (abstract).

***Finding of Prima Facie Obviousness Rationale and Motivation  
(MPEP §2142-2143)***

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to combine the teachings of Yoshimaru et al., Cyr, Hunter and Laundon et al. or Wang et al. or Spencer or Jenkins et al. and utilize zinc oxide in a method of producing a sunscreen, a method for vulcanizing, a method for pigments, a method for preparing a synthetic resin, a method for producing a cosmetic, a method of producing a ceramic or a method for producing a catalyst. One of ordinary skill in the art would have been motivated to add zinc oxide to a sunscreen, to a vulcanizing process, to paints or varnishes, to resins, to cosmetic formulations, to ceramic formulations and catalyst formulations. One of ordinary skill in the art would have been motivated to utilize zinc oxide in any of these methods or formulations as they are all known uses for zinc oxide. Therefore, it would have been obvious to utilize zinc oxide in known methods or formulations.

Absent any evidence to the contrary, and based upon the teachings of the prior art, there would have been a reasonable expectation of success in practicing the instantly claimed invention. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

The provisional rejection of claim 1 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 11/039,871 is **withdrawn** in light of applicants' amendments filed on September 26 2008, in which the claims now recite specific shapes of the particles which do not overlap with those of copending '871.

The rejection of claims 1 and 17 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 8 of U.S. Patent No. 7,371,337 is **withdrawn** in light of applicants' amendments filed on September 26 2008, in which the claims now recite specific shapes of the particles which do not overlap with those of Patent '337.

**Claims 1, 3-13, 16-17 and 28-35 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 7235398 (which is application No. 10/522778). Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims overlap in scope.**

The instant application claims a composition comprising nanoscale pyrogenically produced zinc oxide powder having a BET surface of 10 to 200 m<sup>2</sup>/g, wherein said composition is in the form of aggregates of anisotropic primary particles and that the aggregates display an average diameter of 50 to 300 nm wherein the aggregates comprise a mixture of nodular primary particles and acicular primary particles whereby the ratio of nodular to acicular primary particles is between 99:1 and 1:99. The instant application claims a process for the production of the composition wherein zinc powder is converted to zinc oxide powder in four successive reaction zones which are an evaporation zone, a nucleation zone, an oxidation zone and a quench zone.

Patent '398 claims pyrogenically prepared doped zinc oxide powder. The claimed particles have overlapping diameters and BET surface area. The particles are claimed as having a largely anisotropic structure defined by a form factor  $F(\text{circle})$  of less than 0.5. The process for preparing the particles are the same as instantly claimed except the evaporation zone instantly claimed is called a vaporization zone in Patent '398.

The difference between Patent '398 and the instant application is that Patent '398 does not expressly state aggregates comprising a mixture of nodular and acicular primary particles. Patent '398 additionally claims the presence of a doping agent.

Regarding the claimed particle shapes, since the process of making the particles of Patent '398 is the same as instantly claimed it is examiner's position that the shape of the particles are necessarily the same. While Patent '398 does additionally claim a doping agent, the instant claim language is open ended and therefore allows for additional ingredients such as a doping agent to be included.

Therefore, the scopes of the patent claims and the instant application overlap and thus they are obvious variants of one another.

### ***Conclusion***

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABIGAIL FISHER whose telephone number is (571)270-3502. The examiner can normally be reached on M-Th 9am-6pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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